Unit 11
Day 5
Applications of Equations of a Line

(10) $(2, 0)$, $(0, \underset{\text{y-int}}{-6})$ ← b

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-6-0}{0-2} = \frac{-6}{-2} = 3$$

$y - y_1 = m(x - x_1)$

$y - 0 = 3(x - 2)$

$y = 3x - 6$

$y = mx + b$

$y = 3x - 6$

$-3x + y = -6$

$\boxed{3x - y = 6}$

$3x - y = 6$

$3x = 6$

$x = 2$

$-y = 6$

$y = -6$

(9) $(-3,4)$

$$m = \frac{1+3}{2+1} = \frac{4}{3}$$

$\perp m = -\frac{3}{4}$

$$y - y_1 = m(x - x_1)$$

$$y - 4 = \frac{4}{3}(x+3)$$

$$y - 4 = \frac{4}{3}x + 4$$

$$-\frac{4}{3}x + y = 8$$

$\rightarrow 4x - 3y = -24$

#2

11) $(-4, 3)$

$x = -4$ vert

$y = 3$ horiz

$(-4, 3), (0, 0)$

$m = -\frac{3}{4}$

$y - 3 = 1(x + 4)$

$y - 3 = x + 4$

$-x + y = 7$

$x - y = -7$

$y = -\frac{3}{4}x$

$\frac{3}{4}x + y = 0$

$3x + 4y = 0$

1) A piece of antique jewelry is purchased for $500 and increases in value at a constant rate of 15% per year. Write an equation for value J after t years.

$$J = 500 + 500(.15)t$$

$$J = 500 + 75t$$

2) Suppose that a worker's yearly salary is $30,000 and that salary increase will be at a rate of 12% per year. Assume that the inflation rate is 8% per year. Write an equation for the real buying power of the salary after t years.

Buying Power % $= 12\% - 8\% = 4\%$

$$B = 30000 + .04(30000)t$$

$$B = 30000 + 1200t$$

3) Karl Robbins bought a car for $23,500. For tax purposes, Karl assumes a depreciation of 6% per year on the car.

a. Write an equation for the value, V, of the property after t years.

$V = 23{,}500 - .06(23500)t$

b. After 2 years, what would the value of the car be?

$V = 23500 - .06(23500)2$

c. Determine how many years it would take for the car to be worth $16,450?

$16450 = 23500 - .06(23500)t$

d. How long will it take to depreciate the car to $0. Round your answer to the nearest whole number of years. $0 = 23500 - .06(23500)t$

HW 3 Wkshts